means for inserting at origin at predetermined times known symbols P(i,fj) as components at tone fj of multitone symbols Si;

means for detecting at destination at said predetermined times the components Rk(fj) and for deriving therefrom the coefficients $H_{ik}(fj)$ of the transfer matrix H(fj);

means for multiplexing data to be transmitted from destination to origin with the coefficients $H_{ik}(fj)$; and

means for extracting from the data received at origin said coefficients $H_{ik}(fj)$.

REMARKS

Please enter the claim amendments defined herein as they further define the Applicants' contribution to the art. Favorable action is hereby earnestly solicited.

If the filing of any paper in this application necessitates the payment of a fee under 37 CFR §§ 1.16 and 1.17, and the fee due is in an amount different from any enclosed check or if no check is enclosed, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 23/2825.

If the filing of any paper in this application necessitates an extension of time under 37 CFR §1.136(a), the Applicants hereby request such extension of time. If the fee due is in an amount different from any enclosed check or if no check is enclosed, the Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 23/2825.

Respectfully submitted,

By: _____

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Attorney's Docket No. S1022/8495
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MARKED-UP CLAIMS

3. (Amended) The far-end [crosstalkcanceling] crosstalk canceling circuit of claim 1, further comprising:

storing means storing transfer matrices of the plurality of transmission channels at tones being defined by R(fj)= H(fj)* S(fj), where R(fj) is the vector R(fj)= (Ri(fj)) i = 1 to n and S(fj) is the vector S(fj) = (Si(fj)), i = 1 to n, Ri(fj) and Si(fj) being the components at tone fj of the received discrete multitone symbol Ri and transmitted discrete multitone symbol Si respectively; and

inversion means sequentially inverting said transfer matrices H(fj) and supplying the precompensation means with the inverted matrices $H^{-1}(fj)$, the precompensation means sequentially calculates the products $H^{-1}(fj)*S(fj)$.

4. (Amended) A digital subscriber line transmission system comprising a plurality of line termination modems transmitting discrete multitone symbols Si to corresponding network termination modems over n transmission channels, comprising:

a far-end crosstalk canceling circuit according to claim 1, canceling far-end crosstalk at the network termination side of said system; and

[an] a line termination far-end crosstalk canceling circuit canceling far-end crosstalk at the line termination side of said system by estimating the inverse of the transfer matrix H^{-1}_{up} of the plurality of the transmission channels in the upstream direction, said line termination far-end crosstalk canceling circuit supplying the storing means of said far-end crosstalk canceling circuit with $H= H_{up}$.

5. (Amended) A digital subscriber line transmission system comprising a plurality of line termination modems transmitting discrete multitone symbols Si to corresponding network termination modems over n transmission channels, comprising:

a far-end crosstalk canceling circuit according to claim 3 canceling far-end crosstalk at the network termination side of said system; and

[an] a line termination far-end crosstalk canceling circuit canceling far-end crosstalk at the line termination side of said system by estimating the inverse of the transfer matrices $H_{up}(fj)$ of the plurality of transmission channels in the upstream

direction at tone fj, said line termination far-end crosstalk canceling circuit supplying the storing means of said far-end crosstalk canceling circuit with $H(fj) = H_{up}(fj)$.